

REMARKS

This Preliminary Amendment is filed in response to the Final Office action dated October 2, 2007 along with a Request for Continued Examination and the associated fee. All objections and rejections are respectfully traversed.

Claims 1-40 are in this case.

Claims 1, 12, 13, 18, 20, 26, 30, 31, and 35 have been amended to better claim the invention

Claims 36-40 have been added to better claim the invention.

REQUEST FOR EXAMINER INTERVIEW

Applicant respectfully requests a telephonic interview with the Examiner after the Examiner has had an opportunity to consider this Amendment, but before the issuance of the next Office Action. The Applicant may be reached at 617-951-2500.

OBJECTION TO THE SPECIFICATION

At page 2 of the Final Office Action, the examiner objected to the specification under 36 CFR §1.97 and §1.98 because the specification contained references to related applications by outdated application numbers. The references to the related applications have been updated.

CLAIM REJECTIONS UNDER 35 U.S.C. §112

At page 3 of the Final Office Action, claim 30 was rejected under 35 U.S.C §112, first and second paragraphs, as failing to comply with the written description requirement and as having insufficient antecedent basis. Applicant respectfully traverses these rejections. On page 17-18 the application specifically discloses “recovered failed storage ap-

pliance alerts the surviving storage appliance that a giveback command should be initiated... *where the giveback operation is initiated by an administrator or user* of the system entering a command in, for example, a command line interface (CLI) or by selecting an option in a graphical user interface (GUI) that is operatively interconnected with the storage appliance and storage operating system. Therefore claim 30 is believed to be in allowable condition. Also, claim 30 has been amended to more clearly claim the invention.

REJECTION UNDER 35 U.S.C. §102(b)

At page 4 of the Final Office Action, claims 1-4, 8-12, 16-21, 26-31, and 35 were rejected under 35 U.S.C. §102(b) as being anticipated by “A Highly Available Network File Server,” Proceedings of the Winter 1991 USENIX Conference, Bhide *et al.*, January 1991 (hereinafter “HA-NFS”).

The present invention, as set forth in representative claim 1, comprises in part:

1. A method for failover of a first device to a second device in a storage network, the method comprising steps of:

detecting a failure in the first device;

initializing a second virtual port on an associated physical port of the second device, the second virtual port sharing its associated physical port with at least one other virtual port;

configuring the second virtual port with an identity of a first virtual port on a physical port on the first device; and

servicing a set of disks owned by the first device at the second device through the second virtual port

HA-NFS discloses a system which contains two NFS servers sharing a number of SCSI buses. Each shared SCSI bus and disks connected to it have one server which is designated as the primary server. When the servers are operating normally, the disks are

served only by their designated primary server. The primary server for each bus is selected such that the total load is balanced (statically) over the two servers. Additionally, each server acts as a backup for the other, thereby allowing access to the failed device's data. In particular, each server has two physical network interfaces and two associated IP addresses, one being a primary physical interface/port and another being a secondary physical interface/port. During normal operation, the primary interface is used by the server. The secondary interface is only used by the server when it is impersonating the other server after the other server has failed. HA-NFS also implements the secondary server to be utilized when reintegrating the system after repair or maintenance.

Applicant respectfully urges that HA-NFS does not show Applicant's claimed novel *initializing a second virtual port on an associated physical port of the second device, the second virtual port sharing its associated physical port with at least one other virtual port.*

Applicant's claimed invention is directed to a system and method for providing failover for a first port (e.g., on a first server/device) to a second port (e.g., on the first or a second server) in a storage network by utilizing virtual ports rather than physical ports. Specifically, when a device (an adapter) is operating in a "multi-ID" mode, the storage appliance is connected to a switching fabric and therefore may require multiple virtual ports per physical port (see Applicant's Specification page 15 lines 1-21 for a detailed description of the multi-ID mode). In particular, a virtual port is a functional nonphysical port initiated through virtualization software in a virtual database which defines said virtual port. Thus, instead of each device having two separate physical ports (one primary and one secondary), each device need only have one physical port having a first (primary) virtual port and a second (secondary) virtual port. Said differently, a single virtual port may comprise a plurality of virtual ports, which are each dynamically configurable to inherit a particular identity (e.g., IP address). In particular, Applicant's invention de-

tects when a first device in a storage network has failed, and initializes a second virtual port on a second device allowing access to data that is otherwise inaccessible during failure of the first device. To do this, the system configures the second (e.g., previously inactive/offline) virtual port with the identity of the first (i.e., primary or active) virtual port on the first/failed device, thereby allowing the second device to service a set of disks owned by the first/failed device through the use of the second virtual port on the second device.

HA-NFS does not disclose or address utilizing a virtual port on an alternate/second device to access/service a set of disks owned by a first device. In particular, HA-NFS specifically uses two physical ports/interfaces to access a server. As mentioned in Applicant's Background of the specification, a noted disadvantage of such failover configurations (i.e., as shown in HA-NFS) is the requirement for a second interface/physical port on the storage appliance, which necessitates that an additional port be located on any failover device. As the second port typically operates in a standby mode for the vast majority of time (e.g., at all times except during a failover), the requirement for a second physical port/interface (e.g., "port burn") not only increases the costs of the appliance and its associated routing hardware, but also increases the costs for a system administrator to establish and maintain such a clustered server configuration. In effect, a server failover configuration, as in HA-NFS, may require twice as many physical ports on the server and switches (failover devices) as are normally needed without a failover configuration. It is thus an object of the present invention to provide a system and method for reducing port burn in a storage system. Applicant's invention claims a virtual port located on the second server/device to service the disks/storage devices owned by the first server rather than a physical port.

Again, HA-NFS discloses the use of two physical ports on each server to provide failover. Conversely, Applicant's claimed novel invention uses virtual ports (accessible through one or more physical ports) on a server for failover, such that separate physical

ports need not be maintained (i.e., reducing port burn), for example, where a plurality of virtual ports may share a single physical port. In this manner, rather than dedicate a physical port with a new failover identity as in HA-NFS, Applicant's claimed invention may allow a physical port to have multiple virtual port identities, thus not requiring a separate physical port for each identity (e.g., multiple primary and/or secondary virtual ports on a single physical port).

Applicant respectfully urges that the HA-NFS document is legally precluded from anticipating the claimed invention under U.S.C. §102(b) because of the absence from HA-NFS of Applicant's claimed novel *initializing a second virtual port on an associated physical port the second device, the second virtual port sharing its associated physical port with at least one other virtual port.*

REJECTION UNDER 35 U.S.C. §103(a)

At page 9 of the Final Office Action, claims 5-7, 13-15, 22-25, and 32-34 were rejected under 35 U.S.C. §103(a) as being unpatentable over HA-NFS and in view of Shea *et al.*, U.S. Patent Application Publication No. 2004/0081087, published on April 29, 2004. Claims 5-7, 13-15, 22-25, and 32-34 are dependent from independent claims that are believed to be in condition for allowance for the reasons described above, and therefore claims 5-7, 13-15, 22-25, and 32-34 are also believed to be in condition for allowance.

CONCLUSION

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

PATENTS
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Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account
No. 03-1236.

Respectfully submitted,

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